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CEREAL DISEASES

NOTE: Due to this year's unprecedented outbreak of bacterial wilt (Aplanobacter stewartii) of corn much interest has been shown in possible future disease-free seed sources. Oregon is one of the States in the Rocky Mountain region and the Northwest in which the disease has never been found.

BACTERIAL WILT OF CORN NOT FOUND IN OREGON

H. P. Barss

The bacterial disease of corn which has caused so much damage during the last two years in the eastern part of the country has never been reported from Oregon nor has it been seen by members of the Experiment Station staff, the Agricultural Extension Service workers, or the staff of the School of Agriculture here.

This year Professor G. R. Hyslop and the writer of this note made a special visit in late September to plantings of sweet corn being produced for seed purposes. One was a field of Golden Early Market, the other a field of 12-Rowed Golden Bantam. No trace of bacterial disease was found in either of these fields. Only a few stunted plants were found. These, when examined microscopically, showed no trace of anything resembling the bacterial wilt. This experience adds to our conviction that seed corn obtained from this State is not likely to contain even a trace of bacterial contamination.

FRUIT DISEASES

LATE INFECTION OF PEACH LEAF CURL IN THE CAROLINAS

R. F. Poole

Peach leaf curl (Exoascus deformans) outbreaks are frequent in western North Carolina at elevations around 1,000 feet. It is sometimes seen near sea level in Currituck and other eastern counties. It has never been known to be of any economic importance in the sandhill areas of this State. It is sometimes observed the first year on new plantings recently obtained from large nurseries but fails to recur the following year on these young trees. In the sandhill areas many growers use oil sprays for the control of San Jose scale. Some use the lime sulfur spray for this purpose, but never with any aim of protecting trees from the curl, which many of the growers have never seen. Even those growers using oil sprays in these areas have not observed any occurrence of curl on production trees.

The 1932 season was cool and wet during the early formation of the fruit. A most satisfactory development of foliage and new growth of twigs occurred during the spring season. The blooming was the most irregular seen in many years. Blooming of such varieties as Elberta and Hale, especially on individual trees, extended over a period of two weeks. The fruit was therefore very irregular in growth and in ripening.

When the largest peaches were one-half to three-fourths inch in diameter, small hypertrophic areas were seen, usually on one side and near the calyx end. At first these areas were of the same color as the normal tissues, but as the ripening of the fruit advanced they developed a deep red to purplish pigment. The inner flesh radiated with similar colors. The infected portions, sometimes to a depth of one-fourth inch, broke down rapidly after the fruit ripened. The infected tissue increased throughout the summer, enlarging to one-half inch in diameter. The raised areas sometimes presented many uneven hypertrophic growths.

In 1930, several abandoned orchards near Charlotte, North Carolina, and Spartanburg, South Carolina, were almost completely defoliated by the curl disease. The fruit in these orchards had less than 10 per cent fruit infection. One-half the entire individual fruit was infected in most specimens observed. The affected tissues were not raised but decidedly atrophic and the surface was smooth. The reddish to purplish color extended deep into the flesh. Growth was suppressed on the side infected, but continued on the side not infected, resulting in a distinct malformation. The same symptoms were observed in Georgia in 1928.

Specimens of fruit showing the peculiar symptoms developed this year were identified by John Roberts of the Bureau of Plant Industry.

No infection was observed on the early varieties, Belle (Georgia), Hiley (Early Belle), Red Bird, and Carman, even though these varieties were grown adjacent to Elberta and Hale that showed infected peaches. The greatest infection was observed on Hale. The greatest amount of infection on individual trees was 15 per cent. The individual orchards generally showed less than 2 per cent infection. Nearly every orchard throughout the sandhills showed some infection.

The confusing points are, where did the inoculum originate and why did the foliage escape infection, especially the leaves that were forming during the period that the fruit was becoming infected?

A few infected fruits preserved in sulfur dioxide and formaldehyde will be supplied to anyone interested in studying peach leaf curl.

DISEASES OF LATHAM RASPBERRY IN ILLINOIS

H. W. Anderson

The Latham raspberry is being extensively introduced in southern (Illinois) areas. Until about two years ago we found it comparatively free of disease. During the last season it has developed a number of diseases which make questionable the advisability of attempting to grow it under southern conditions.

The Septoria leaf spot (Mycosphaerella rubi) has been extremely severe and has practically defoliated all the 1932 canes in southern Illinois. Leaf rust, caused by Pucciniastrum americanum, is generally prevalent and apparently responsible in part for the heavy defoliation. As previously mentioned (Pl. Dis. Reptr. 16: 49) this was prevalent in 1929 in a single plantation. The distribution is very much extended this year and is apparently epidemic in form. The Latham seems very susceptible to this rust. Dodge (Journ. Agr. Res. 24: 1923) mentions the fact that hybrids of Latham were susceptible. Mills (Pl. Dis. Reptr. 15: 135) reports Latham as especially susceptible.

Gray bark appeared on the 1932 canes during the latter part of August and is extremely common. This has been determined to be a phase of anthracnose (Illinois Experiment Station Bulletin 383). At Urbana the spring and summer form of the anthracnose (Plectodiscella veneta) was extremely destructive, while in southern Illinois only a light infection occurred. However, the gray bark phase or the fall anthracnose lesions are quite as abundant in southern Illinois as in the Urbana region. Spraying experiments show that the spring and summer anthracnose can be controlled on Latham by delayed dormant application but that the gray bark stage appears in spite of the comparative freedom of the

canes from the pit lesions. It is probable that late summer applications must be made to control the gray bark disease. (Oct. 13).

DISEASES OF VEGETABLE AND FIELD CROPS

NOTES ON SOME OF THE IMPORTANT DISEASES OF CANNING CROPS IN MARYLAND 1932

H. A. Hunter

SNAP BEANS: Anthracnose (Colletotrichum lindemuthianum) caused very little loss except in several cases in which eastern-grown infected seed was used. In these cases the crop was practically a total loss. The general use of western seed has materially reduced anthracnose damage in Maryland.

Bacterial blights (Bacterium phaseoli, etc.) were widespread throughout the canning sections and caused greater losses than usual. Normally, early-planted beans are the only ones appreciably affected by the blights, and the injury is caused almost entirely by the leafspot phases of the diseases. This year, however, the diseases were prevalent throughout the canning season and considerable injury resulted from pod and stem infections. Full Measure was much more susceptible than Burpee's, Giant, or New Stringless Green Pod.

Mosaic (Virus) was generally distributed and caused considerably greater losses than in an average year. Except in the Refugee variety, it is unusual to find more than a low percentage of plants showing symptoms of the disease, and these symptoms often become masked by midseason.

Root rots (Fusarium and Rhizoctonia) were generally distributed and caused about the usual amount of damage. Injury is more severe in the intensive bean-producing areas.

LIMA BEANS: Bacterial spot (Bacterium vignae) was of little significance in all fields observed except one. In this case, home-saved seed was used. The leaves, stems, and pods were heavily infected, and only the dry weather during the maturity period prevented the crop from being a total loss.

Root rots (Fusarium and Rhizoctonia) were prevalent in most fields but no outstanding losses were observed.

Downy mildew (Phytophthora phaseoli) was not observed, and only a few specimens of pod blight (Diaporthe phaseolorum) were noticed during the season.

SWEET CORN: Root, stalk, and ear rots (Various organisms) were not more prevalent than usual, although dry weather during part of the season probably accentuated the symptoms of root and stalk rots. These diseases always cause severe losses in Maryland.

Smut (Ustilago zeae) caused a small fraction of one per cent damage, but could hardly be called a serious production factor.

Bacterial wilt (Aplanobacter stewartii) was observed in only one planting of sweet corn for canning. The late varieties used in Maryland for canning usually escape the disease.

PEAS: Root rot (Aphanomyces euteiches) was general and destructive, as usual. Favorable conditions for the fungus earlier in the season coupled with dry weather just prior to the time of maturity probably accentuated symptoms of the disease.

Wilt (Fusarium orthoceras var. pisi) caused heavy losses in certain fields. The disease usually occurs together with root rot. The value of wilt-resistant strains of Alaska was clearly demonstrated in tests on wilt-infested land.

Bacterial blight (Bacterium pisi) was observed in a number of fields but caused very little loss.

Blight, pod spot, and foot rot (Ascochyta spp. and Mycosphaerella pinodes) were general but not serious.

TOMATOES: Wilt (Fusarium lycopersici) was somewhat more destructive this year than it has been for several years past. The combination of weather conditions was evidently more favorable for injury by the disease. In many cases the Marglobe variety was appreciably affected.

Early blight (Alternaria solani) was generally distributed but caused less damage than last year. Heavy infection occurred early in the season, but after partial defoliation the new leaves remained uninfected and green until frost.

Leaf spot, or blight (Septoria lycopersici) was much more prevalent than it has been for several years and caused practically as much damage as early blight. The disease was not observed in Maryland last year and only a trace occurred the year before.

Mosaic (Virus) was prevalent, as usual, and probably caused somewhat more damage than for the past several years.

Bacterial spot (Bacterium vesicatorium) was general and caused considerable damage in several fields observed.

Bacterial canker (Aplanobacter michiganense) occurred in a few communities. In all cases observed, the presence of the disease was

traced to the use of southern plants or of infected seed.

Blossom-end rot (non-parasitic) was general throughout the State and was severe in some sections, causing a total loss greater than in 1931. As usual, the Marglobe was noticeably resistant to injury as compared to the Greater Baltimore and Stone types.

Sun-scald (non-parasitic) was brought about by a week of exceptionally high temperatures early in the picking season. The loss in quality and from secondary rots was considerable.

Collar rot (Various organisms) occurred only in isolated cases, notably where beds had been located on the same ground for several years in succession.

Damping-off (Various organisms) was not observed in open or cloth-covered beds.

Buck-eye rot (Phytophthora terrestris) was observed in a number of fields but caused no appreciable damage. (Oct. 25).

TOMATO DISEASES IN MASSACHUSETTS IN 1932

E. F. Guba

In spite of the unusually heavy crop of field grown tomatoes in Massachusetts, and monetary returns much below the cost of growing this commodity, more than usual interest has been shown in various fungous diseases which this year eventually wiped out the crop on fully 90 per cent of the farms. An extremely early and heavy infestation of flea beetles contributed to and encouraged severe infection from early blight (Alternaria solani). But, even in the absence of flea beetles, severe epidemics of early blight destroyed many of the plantings prematurely. Leaf mold (Cladosporium fulvum) was unusually severe on field tomatoes. In a large varietal planting at the Field Station in Waltham, the Norton variety showed a high degree of resistance. Both leaf mold and early blight developed in epidemic fashion on trellised as well as ground tomatoes.

Bacterial canker (Aplanobacter michiganense) was epidemic in many fields of trellised tomatoes where it caused a total loss of the crop. Similar losses were observed in some greenhouses in June and July but no cases of bacterial canker have been noted on the present fall planting of greenhouse tomatoes. The last epidemic of this disease on greenhouse tomatoes occurred in the fall of 1930. Other factors aside from contaminated seed apparently account for the widespread and sporadic occurrence of the disease in certain seasons.

Wilt (Verticillium ovatum) and early blight together completely ruined several fields of trellised tomatoes by August 15. On these farms, eggplants are grown each year and wilt has always been a factor in crop losses.

Not since 1905 has Massachusetts experienced such a rapid and great destruction of its late tomato crop as occurred this year from the downy mildew (Phytophthora infestans DBy.), and judging from the report of Dr. George Stone (Mass. (Hatch) Agr. Exp. Sta., Ann. Rept. 1906, p. 115) the damage done in 1905 was relatively insignificant as compared to the destruction of the crop of 1932. In view of the large crop and poor monetary returns, many growers welcomed the loss of their outdoor tomatoes as a means of booming prices of their greenhouse tomatoes. At the present writing, however, downy mildew is causing enormous losses to the fall greenhouse crop of tomatoes. The disease is especially severe in greenhouses where careless methods of watering are practiced, and where growers have failed to heat and to ventilate properly at night and early enough in the season to keep the plants from sweating. Crops in leaky greenhouses have already experienced a great loss. The market men and buyers hesitate to speculate in tomatoes from sources having the disease since lots rot over night in the packages.

Unusual weather conditions prevailed during the season to account for the epidemic prevalence of the disease. Heavy rains of long duration occurred in August and early September. The days were warm and nights cool, but not until mid October were the nights cool enough to justify heat in greenhouses. Previous to August, there had been a long period of drought. The weather conditions of 1905, when the last epidemic of downy mildew on tomatoes occurred, were practically identical. Of great interest also is the fact that this is not a potato late blight year, although a few, severe, isolated cases of potato late blight have come to the writer's attention. In other years of potato late blight epidemics tomato downy mildew has not been of any consequence. The only inference, therefore, is the conclusion arrived at by Berg (West Virginia Bull. 205, 1926) that tomato downy mildew differs biologically from the form which produces potato late blight. (Oct. 18).

VEGETABLE DISEASES IN MASSACHUSETTS

O. C. Boyd

Following are observations on unusual or important crop diseases for September:

CARROT: Macrosporium leaf blight (Macrosporium carotae), generally not so damaging this year on the fall crop as in the average year; 50 per cent loss due to severe defoliation in one large planting in Montague; field near river.

SQUASH: Bacterial leaf spot (Bacterium cucurbitae) was very prevalent in 1931, but almost totally absent in 1932; observed in only two fields, one in Seekonk and one in Westfield; only trace of damage in either.

Black rot (Mycosphaerella citrullina). This is the first time I have observed M. citrullina on the fruit of summer squash. Pycnidial production occurred on both runner and fruit. Typical circular spots were observed on well matured squashes in the field, resembling those on vege-

table marrow in 1931; observed September 29 at M. S. C.

On winter squash rapid development of the disease occurred on the vines in the field during the month. There was copious production of spores on petioles, runners, stems, and fruit stalks in many fields that reached a normal maturity by harvest time. It was not so prevalent on later or immature vines. It appears to be most prevalent only after vines have begun to die down. Severe loss to the vines themselves was observed in one field in Plymouth County, where squash was planted after a sod crop; hence seed origin of the disease. Other instances were seen of girdling and killing of leaf petioles and runners by the fungus. Striking instances were observed of heavy pycnidial production on the base of main runners and on the stems of plants in fields that had not grown a cucurbit crop for several years, indicating that the disease had arisen from infected or contaminated seed. Generally, more disease was observed where squash had been planted in the same field for more than a year where crop rotation was practiced, indicating the possibility of carry-over on the old vines.

MUSKMELON: Downy mildew (Pseuoperonospora cubensis), leaf blight (Macrosporium cucumerinum), and powdery mildew (Erysiphe cichoracearum) were all common and in some instances destructive to the foliage in most fields that had not been properly protected with copper dust or spray. Instances of good commercial control of those diseases were observed in Hampshire and Plymouth Counties where dusting and spraying were carried out through the entire life of the crop.

CUCUMBER: Downy mildew (P. cubensis) developed rapidly during the month, "burning" down the foliage in most fields during the first half of September, or even earlier. This disease, however, was well controlled in some fields by the same methods used for melons.

WATERMELON: Downy mildew (P. cubensis) was observed in Dighton and Gill, but did little damage as compared with that in muskmelons and cucumbers.

Mycosphaerella citrullina spots and lesions were observed on watermelon leaves and petioles in Gill, September 23.

Anthracnose (Colletotrichum lagenarium) was the most common and damaging disease of watermelon this year. It developed late in the season mostly after September 10, but caused severe defoliation in some patches visited, and poxed the fruits as well. Anthracnose was observed during the month in Essex, Bristol, Barnstable, Middlesex, Hampden and Franklin Counties. One pile of melons at a roadside stand in Worcester showed on September 28, 100 per cent fruit infection. Poxed fruits were observed in the field in Westfield on September 29.

CELERY: Late blight (Septoria spp.: Cochran, Phytopath. 22: 791-812. Oct. 1932) has not developed this fall as much as it ordinarily does. Only rare instances of damage from the small-spotted form (S. apii-graveolentis Dorogin) have been observed. A few scattered infections of

the large-spotted form (S. apii (Br. & Cav.) Chester) have been seen this summer and fall, but it is not very common.

Early blight (Cercospora apii) on the other hand, which was very inconspicuous during the earlier part of the season, became active following the late July rains, and continued to spread rapidly in many fields, causing the usual, heavy damage to both Plume and Pascal crops. Where thorough dusting or spraying had been practiced, however, during the entire season good control was secured generally. Many growers failed to control it due to a late start in the fields, after the disease had begun its rapid development. It appears to be difficult for the growers to understand the importance of all of the essential steps in the control of celery blights, that is, seed treatment, seedbed rotation and spraying or dusting, and dusting or spraying the fields. Any one or two treatments are incomplete and inadequate without the remainder.

CABBAGE AND CAULIFLOWER: Bacterial spot (Bacterium maculicolum) developed slightly during the month, but was decidedly less damaging this fall than in the average year. The same is true of black rot (B. campestre) and black leg (Phoma lingam). The dry weather early in the summer was helpful in the natural control of those troubles.

SPECIMENS RECEIVED

Corticium stevensii Burt (Hypochnus ochroleucus Noack) on apples, causing stem canker and leaf blight. W. D. Valleau, Kentucky, Sept. Det. J. A. Stevenson.

Coleosporium solidaginis (Schw.) Thüm. on Pinus resinosa. Monmouth, Kennebec County, Maine, Iva M. Burgess, June 27. Det. F. L. Markin.

Uromyces caladii (Schw.) Farl. on Peltandra virginica. Canal Bank at Chain Bridge, Maryland, C. A. Ludwig, Sept. 26. Det. J. A. Stevenson.

Uromyces pontederiae W. Gerard on Pontederia cordata. Four Mile Run, near Alexandria, Virginia, D. P. Limber, Oct. 23. This has been confused with U. caladii, due probably, as Miss Edith Cash suggests, to Saccardo's statement that the two species are identical. Both Sydow and Arthur recognize them as distinct, and they are quite different both macroscopically and in spore size. (D. P. Limber).